

What is claimed is:

1. A method of determining cells for deletion in a network design, comprising:
simulating operation of the network to generate statistics for each cell of a given group of cells;
evaluating statistics of each cell based on a given ranking criteria;
ordering cells of the group by rank based on the evaluation; and
deleting the highest ranked cell.
2. The method of claim 1, wherein only a single simulation of the network is performed to determine cells for deletion.
3. The method of claim 1, wherein said simulating, evaluating, ordering and deleting are repeated until a desired number of N cells are deleted.
4. The method of claim 1, wherein the network design is applicable to determining site selection of cells for an initial network deployment.
5. The method of claim 1, wherein the network design is applicable to determining cells for deletion as part of a network overlay or upgrade of an existing network.
6. The method of claim 1, wherein said generated statistics include statistics related to at least one of a number of soft handoff legs for each cell of the group, total active legs for each cell of the group, and total number of simplex and softer-handoff legs for each cell of the group.
7. The method of claim 6, wherein
said ranking criteria is based on a ratio of soft handoff legs to total active legs, and

said ordering includes ranking the cells in order of highest ratio of soft handoff legs to total active legs, the highest ranked cell being the cell with the highest ratio.

8. The method of claim 6, wherein

said ranking criteria is based on a total number of simplex and softer-handoff legs per cell, and

said ordering includes ranking the cells in order of lowest number of simplex and softer-handoff legs, the highest ranked cell being the cell with the lowest number of simplex and softer-handoff legs.

9. The method of claim 1, wherein

said statistics are related to one of data for bins of area covered by each cell or data for each mobile user in proximity to each cell, and

said ranking criteria is based on a threshold value for the bin data or mobile user data,

said evaluating includes comparing the bin data or mobile user data for each given cell to the threshold, and

said ordering includes ranking the cells in order of the degree at which the bin data or mobile user data for a given cell exceeds the threshold, the highest ranked cell being the cell having bin data or mobile user data exceeding the threshold to the highest degree.

10. The method of claim 1, wherein

said statistics are related to one of data for bins of area covered by each cell or data for each mobile user in proximity to each cell, and

said ranking criteria is based on using the said statistics to estimate the impact of cell deletion on a population of mobiles or bins in proximity to such cell,

said evaluating includes calculating a communication parameter for one or more of the mobiles or bins in proximity to the cell, and

said ordering includes ranking the cells in order of the lowest adverse effect on a given mobile population or bins in an area, based on the evaluation of the calculated communication parameter.

11. The method of claim 1, further comprising:

second evaluating a network parameter related to deletion of the highest ranked cell against a given screening criteria to determine the influence the deleted cell has on the network;

allowing deletion of the highest ranked cell if the network parameter satisfies the screening criteria, else

rejecting the deletion of the highest ranked cell.

12. The method of claim 11, further comprising repeating the second evaluating, rejecting and deleting steps until the network parameter for a given cell deletion candidate satisfies the screening criteria, or until a desired number of N cells are deleted.

13. The method of claim 12, further comprising:

terminating the method if no deletion candidate passes the screening criteria.

14. The method of claim 12, further comprising:

accepting the original highest ranked cell for deletion, if no deletion candidate passes the screening criteria, and

repeating said simulating, evaluating, ordering and deleting for N deletions.

15. The method of claim 11, wherein said second evaluating further includes re-simulating the network without the highest ranked cell to obtain the network parameter.

16. The method of claim 11, wherein the network parameter is cell coverage and the screening criteria is whether deletion of the highest ranked cell reduces the normalized cell coverage by less than P%.

17. The method of claim 11, wherein the network parameter is cell capacity and the screening criteria is whether deletion of the highest ranked cell reduces a normalized network capacity by less than P%.

18. The method of claim 11, wherein

the network parameter is area coverage and the screening criteria is whether a particular area is covered, and

the highest ranked cell or another cell deletion candidate is rejected if the area is not covered.

19. A method of selecting one or more cells for deletion in a network design, comprising:

first evaluating, for each cell of a given group of cells, statistics generated from a network simulation based on a given ranking criteria;

ordering cells of the group by rank based on the first evaluation;

deleting the highest ranked cell;

second evaluating a network parameter related to deletion of the highest ranked cell against a given screening criteria to determine the influence the deleted cell has on the network, said second evaluating including:

re-simulating the network without the highest ranked candidate cell to obtain the network parameter,

allowing deletion of the highest ranked cell if the network parameter satisfies the screening criteria, else

rejecting the deletion of the highest ranked cell.

20. The method of claim 19, wherein said second evaluating, rejecting and deleting are repeated until the network parameter for a given cell deletion candidate satisfies the screening criteria, or until a desired number of N cells are deleted.

21. The method of claim 20, further comprising:

terminating the method if all cell deletion candidates fail the screening criteria or after Q attempts to determine a candidate that passes the screening criteria.

22. The method of claim 20, further comprising:

accepting the original highest ranked cell for deletion, if all cell deletion candidates fail the screening criteria or if no deletion candidate passes the screening criteria after Q iterations of said re-evaluating, and

repeating said first evaluating, ordering and deleting until a desired number of N cells are deleted.

23. The method of claim 19, wherein the network parameter is area coverage and the screening criteria is whether the deletion of the highest ranked cell reduces normalized cell coverage by less than P%.

24. The method of claim 19, wherein the network parameter is cell capacity and the screening criteria is whether the deletion of the highest ranked cell reduces normalized capacity by less than P%.

25. The method of claim 19, wherein the network design is applicable to determining site selection of cells for an initial network deployment, or applicable to determining cells for deletion as part of a network overlay and upgrade of an existing network.

26. A method of determining cells for deletion as part of a network upgrade of an existing, live network, comprising:

generating actual network data for each cell of a given group of cells of the live network;

evaluating the generated data of each cell to a given ranking criteria;

ordering cells of the group by rank based on the evaluation, and

deleting the highest ranked cell from the live network.

27. The method of claim 26, further comprising:

collecting revised network statistics for each cell after deletion of the highest ranked cell from the network, and

determining the influence that the deleted highest ranked cell has on the network based on the collected statistics.

28. The method of claim 26, further comprising:

repeating said generating, evaluating, ordering and deleting N times to delete N total cells.

29. A method of accounting for the effects of inhomogeneity inherent in an actual network when evaluating a desired cell coverage or capacity of a proposed network design versus desired cell count to determine cells for deletion in the proposed network design, comprising:

ranking cells based on a comparison of statistics generated, for each cell, to a given ranking criteria, and

deleting the highest ranked cell.

30. The method of claim 29, wherein only a single simulation of the proposed network design is performed to determine a cell for deletion.

31. The method of claim 29, further comprising:

generating said statistics from one of a network simulation of the proposed network, or based on actual network data for each cell of a given group of cells in a live network.

32. The method of claim 29, wherein the proposed network design is a design for an initial network deployment or a network overlay and upgrade design for an existing network.

33. The method of claim 29, wherein the effects of inhomogeneity that are accounted for include one or more of terrain of the proposed network, non-uniform traffic distribution within the proposed network, potential clutter in the proposed network and site selections requirements introduced by potential real estate and zoning requirements for the proposed network.